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aside from the modern aspects of those scenes, and to behold them as they presented themselves to the men whose story he tells. La Salle, we fully believe, would give his approval to the rehearsal and interpretation of his own plans; and would be satisfied with the estimate of his own character, a noble and profoundly appreciative portraiture, — not an eulogium or a panegyric, — which our author has presented in these pages. Our national literature has, as yet, received few abler or more attractive contributions than are contained in Mr. Parkman's volumes.

GEORGE ELLIS.

- ART. III. — 1. CARL VOGT, *Vorlesungen über den Menschen, etc.* Giessen. 1863. DR. ERNST HÆCKEL, *Natürliche Schöpfungsgeschichte.* Berlin. 1868.
2. DR. L. BÜCHNER, *Sechs Vorlesungen über die Darwin'sche Theorie.* Leipzig. 1868. FRITZ MÜLLER, *Für und Wider Darwin.* Leipzig. 1864.

It is remarkable that the majority of the discoveries and contributions in the great scientific discussion of the day — that on the Development Theory and the Origin of the different forms of life — should have been made almost exclusively during the last fifteen years in England; France having contributed almost nothing to it, and Germany taking up now what England has long since begun. In the French scientific world, the overpowering influence of Cuvier and his "Cataclysm-theory," as well as of his famous discussion before the Paris Academy, in 1830, with Geoffroy de St. Hilaire, on the "Changeability of Species," has been to transfer the question of the formation of species to the region of transcendental speculation, and to leave France from that day to this entirely outside of "the great argument."

In Germany, it was reserved for a poet to give the first indication of the main scientific drift of this half-century. Goethe, who was philosopher as well as poet, in his treatises upon the Metamorphosis of Plants and the Laws of Organization, and his Introduction to Comparative Anatomy (1793), pointed distinctly

towards a theory of development as the most probable explanation of the formation of the various kingdoms of life. He saw clearly the two great laws at the basis of development, and the names which his poetic insight gave to them have clung to them ever since: the law of Inheritance, or "the centripetal force" of all organisms, and the law of Variation (or adaptation), or "the centrifugal force," which continually causes the organism to fly from its ancestral type.

"An inner original community," he says, "lies at the foundation of all organizations. The difference of forms, on the other hand, springs from the necessary relations to the outer world; and one should therefore assume with justice an original contemporaneous variation and an unceasingly progressive development, in order to be able to comprehend the equally constant as varying phenomena."* "For even by this, the harmony of the organic whole becomes possible, in that it is composed of identical parts, which modify themselves in very delicate variations. Related in their innermost, they appear to separate themselves in form, intention, and working to the furthest degree, yes, to set themselves opposite to one another; and so it becomes possible to nature to create and to melt into one another the most different and yet near-related systems, by modification of similar organs (p. 264).† "With the one animal, the bone can be simple and represent only the rudiment of an organ; with others, on the other hand, the same bone will be found in its full development and in its possible perfection" (p. 219).‡

A pleasant instance of Goethe's interest in the development discussion is quoted by Haeckel from Soret's diary: —

"Monday, August 2, 1830. — The news of the opening of the July Revolution arrived to-day in Weimar and put everything in excitement. I went in the course of the afternoon to Goethe. 'Well,' cried he at once, 'what do you think of this great event? The volcano has broken out; everything is in flames, and there is no longer any action with

* Quoted by Haeckel, p. 74. See also the ingenious remarks of Goethe in regard to "Einen aufzustellenden Typus," etc., p. 247 (Stuttgart, 1842), as well his essay on *Osteologie* (1796).

† *Ueber die Gesetze der Organization*, etc. Stuttgart. 1833.

‡ *Einleitung in die vergleichende Anatomie*.

closed doors!’ ‘A fearful affair,’ I replied; ‘but what else could be expected under those circumstances and with such a ministry, than that they would end with the banishment of the royal family?’ ‘We appear not to understand one another, my best one!’ answered Goethe. ‘I do not speak at all of those people. The question with me is about far other matters. I speak of the contest in the academy, so immensely important for science, which has just come to open outbreak, between Cuvier and Geoffroy de St. Hilaire. We have now,’ he continued, ‘in Geoffroy de St. Hilaire a powerful ally for the future. . . . But the best is that the synthetic mode of treating nature, introduced by Geoffroy into France, cannot now be made to step backwards.’”

Besides Goethe, Oken, undoubtedly, in the beginning of this century, in his *Urschleim*, or protoplasm theory, approached some of the latest hypotheses of the development school, as presented by Huxley, Max Schultze, and Haeckel. But this theory was put forward in such a fantastic form, and based on so little careful experiment, that it produced but slight effect on the scientific world.

It is an interesting fact that the great metaphysical thinker of Germany, Kant, should have felt the necessity or desirableness of a theory of genetic connection to explain the forms of organic life. “The agreement,” he says, “of so many varieties of animals in a certain common *Scheme* which appears to lie at the foundation, not alone of their osseous structure, but also in the arrangement of the rest of their parts, . . . allows an indeed weak ray of hope to fall into the spirit, that here at least something may be accomplished with the principle of the *Mechanism of Nature*, without which there can be, indeed, no natural science. This analogy of forms . . . strengthens the supposition of an *essential relationship* of these in their production from a common original mother through the step-like approach of one variety of animals to another, down from that in which the principle of *Object* appears to be most secured, namely, Man, to the polyp, from this to mosses and lichens, and at last to the lowest observable step of nature, — raw matter.”*

The necessity to the mind of this great thinker of some theory of development rather than of constant creation, in order to form any sound natural science, is striking, and in

* Quoted by Haeckel, p. '83.

harmony with the latest philosophical conclusions. In another passage, indeed, he doubts if any Newton will ever arise "who will explain even the production of a blade of grass after natural laws, arranged *without a purpose*." The world of thinkers and investigators may respond that a mechanical theory of organic development "without a purpose" is still as far away as ever, but not so a theory of production and variation which is apparently ruled throughout the organic and inorganic world by one grand all-directing purpose, that is, *progress*. Haeckel's enthusiastic announcement that Kant's doubt is met, and that a Newton has appeared in the science of biology, may indeed be felt as premature; still we may also agree that in the Darwinian theory of Natural Selection one of the great steps has been taken in the progress of human thought.

The words themselves, "Natural Selection," were a happy invention, and will probably always designate the great process by which Nature as a breeder is supposed to be selecting the varieties most suited to their circumstances.

The German term "Natural Breeding" is not so good, and Spencer's "survival of the fittest" does not keep enough in view the ever-working forces proceeding under an intelligent plan, which we call Nature. The idea, however, as often happens with great discoveries, had been promulgated before Darwin, and, singularly enough, the latter had his intention first called to this fact by an American correspondent.*

Dr. Wells, in his account of a "Female of the White Race, part of whose Skin is dark," published in 1818, gave a very distinct statement of the principle of Natural Selection, but he applied it alone to the adaptation of different races of men to their climates, and did not see its wider application.

The conception of the "struggle for existence," which plays so important a part in the Darwinian theory, and which the author states was first suggested to him by Malthus's celebrated work, had been already employed by De Candolle in regard to the relations of the vegetable growths of a country or

* The fact was furnished to Mr. Darwin by the present writer, who obtained it from a quiet but diligent student of science, Mr. Robert Rowley of Hastings-upon-Hudson.

locality. He did not, however, carry out the law to such an extent as Darwin, nor draw from it any general conclusions. The preparation throughout Europe for the Darwinian theory was undoubtedly made by the distinguished reformer in geology, Sir Charles Lyell, who refuted Cuvier's great thesis of cataclysms, or sudden catastrophes on the earth's surface in early geologic periods, and laid down the principle, one of the grandest generalizations of modern thought, that all ancient changes of the earth's surface, however immense or sudden in their appearance, were merely the results of the minute ordinary forces and agencies of to-day, working through enormous periods of time. This conception, once established, of course carries with it also the destruction of the theory of constant successive creations, after each supposed cataclysm; and the scientific mind is led, even in biology, on the true scientific path, of accounting for apparently mysterious and grand events by the slow operation of minute and ordinary causes, continued through immense reaches of time.

It is most honorable to this eminent student of nature, that though in the first editions of his *Principles of Geology* he contended in the most vigorous manner against the development theory of Lamarck (which was not based on strictly scientific principles), yet after the careful observations of Darwin and the statement of the law of Natural Selection, he candidly changed his position in the last edition, and in good measure accepted Darwin's theory.

Of Darwin himself, it has been well understood by his correspondents in various parts of the world, during the last thirty years, that he was unceasingly busy on some ingenious theory of development or explanation of varieties and species. During twenty-one years, — from 1837 to 1858, — while constantly occupied in his investigation, he published nothing, not desiring to put forward his hypothesis till sufficient facts were collected. How his volume on the *Origin of Species* was finally pushed into publicity, through the contemporaneous discovery of the principle of Natural Selection by another acute and original naturalist, Alfred Wallace, is too well known to need particular description here.

Whatever view may be entertained of the soundness of

Darwin's hypothesis as an hypothesis of Origin, or of his theory as a full and complete explanation of the formation of varieties and species, there can be no difference of opinion among scientific thinkers as to the incomparable carefulness and diligence with which he sifts and gathers together his facts, the candor with which he presents objections, and the cumulative and philosophical method of the construction of his famous argument. The great obstacle to the consideration even of his theory, by those not engaged in scientific studies, is what we may call *the refinement* of its reasoning. The hypothesis is somewhat parallel with Lyell's hypothesis of ordinary causes in ancient geological changes. The operation of minute and well-known causes on the small changes going on in the organic world which we see about us is carefully studied, and, under the condition of sufficient time, an hypothesis is framed, which shall explain the vaster and grander changes which have gone on before us. The laws of the "Struggle for Existence," of "Inheritance," "Variation," and "Natural Selection," or the survival of the forms of life most adapted to their circumstances, are claimed to cover all the facts and phenomena of organic life both past and present.

To the mind not trained in scientific reasoning, it seems a conclusion vastly out of proportion to the premises. But from the nature of the case, the premises cannot be complete. The evidence, before it is all put in, must be obtained from all the kingdoms of life in the present, and all past fossil periods. Whole libraries of these records have utterly perished, and vast collections of testimony are now entirely inaccessible. A point of evidence is accidentally hit upon here, a link discovered there, a missing strand in one place or a whole cable of testimony in another. Nowhere is the line of argument uninterrupted. But from a careful study of nature, certain laws have been deduced, such as those of Inheritance, Variation, and Natural Selection, which give a clew and guide at once in explaining a vast number of the present phenomena of organic nature. An hypothesis is framed from these which, it is believed, will cover other and past phenomena, and those on a grander scale. Even Darwin himself would not claim that, as yet, his theory fully explains these, but he might reasonably

ask, "What better hypothesis has been put forward?" for certainly the theory of constant supernatural acts requires even more evidence than his own, and is besides one which excludes scientific and philosophic investigation.

It need not be said to any student of natural science, that the Darwinian theory is one of the great intellectual events of the present century; influencing every department of investigation, and modifying all previous views as to the divisions and classification of the various kingdoms of life.

Nearly all the prominent scientific thinkers in England may be considered to have accepted it, either in part or in whole; and even Owen, though objecting to it nominally, offers a theory of development which seems to differ from it chiefly in name. On the Continent, however, its reception has not been so unanimous. In France, as we stated before, the influence of Cuvier has prevented its just consideration, though two celebrated botanists, Naudin and Lecoq, have avowed their belief in the changeability of species. In Switzerland, however, a distinguished geologist, Pictet, seems to incline towards it. In Germany, the influence of this new hypothesis, as might be expected, has been immense, but the treatment it has received, both from friends and foes, has not been so candid as was to be desired.

The German scientific mind is separated intellectually into two divisions: the specialists, who care little for any general philosophic conclusions; and the generalizers, who are mainly *a priori* thinkers, and eager to establish some theory of their own. The laborious and careful collation of facts, and then the patient and scientific effort to deduce the truth and only the truth from these various phenomena, seems to be a mental position not very familiar to the present scientific mind of Germany.

Unfortunately, too, the question of religion has entered at once into the consideration of this philosophic theory. The advent of Darwinism has been hailed by one party with enthusiastic joy as the dawn of atheism, and every glimmer of it has been denounced by another as the lurid light of infidelity and materialism. Unbelief and Religion have most absurdly divided themselves by the line of this theory.

A celebrated writer on biology and a scientific investigator,

Büchner, the title of one of whose works we have prefixed to this article, has treated the subject as if the great value of Darwin's hypothesis were in relieving mankind of the superstition of a Deity, and in laying a firm basis for materialism.

In his six lectures on Darwinism he has made not a single contribution to the science of the subject, but has unceasingly urged this theory as a full and sufficient substitute for the belief in an intelligent Creator, and indeed as a fatal argument against all processes of reasoning which conclude intelligent design from the mechanism of nature. It is remarkable that this author, as well as the prominent Darwinians of Germany, have treated their great leader's hypothesis with far more certainty and confidence than the author himself expresses. What he is carefully balancing and hesitating to accept, they put aside as already obtained; where he weighs opposing arguments with most scrupulous care, and at length ventures slightly to incline in one direction, they throw in their prejudices and declare the result as evident and not to be contradicted; inferences which Darwin only considers probable his German followers call axioms.

We find in their writings little of the philosophical caution or wide range of view of their leader. They do not seem able even to understand the hesitation of great knowledge and the deliberation of an unbiassed judgment. Thus, among many other instances, Darwin hesitates to accept the cross between the hare and the rabbit as a permanent variety or "species," though it would be a "capital fact" for his theory. The Germans unhesitatingly affirm it. From an immense observation of facts, Darwin refuses to assign external circumstances as the only or the greatest agency in determining variation, though it would be a most convenient conclusion for him. The Germans, like some of our own theorizers, conclude hastily that this is the *causa sufficiens*, and that all varieties are explained by it.

Darwin has feared to imbue his great subject with sentiment, and has wisely avoided touching on what is a necessary inference or link in his theory,—the genetic connection between man and the next lower order in physical structure of mammals and vertebrates. There is not an allusion in his work to the

physical differences or correspondences between human beings and the anthropoid apes. But the connections he does trace or indicate between different kingdoms of life will bridge much wider gaps than that between man and the simian tribes.

The Germans, with less delicacy and wisdom, but more logic, at once attack this difficult subject. Vogt, in his *Vorlesungen über den Menschen*, presents the most thorough comparison yet made between the brains and entire physical structure of man and the apes; attempting to demonstrate, what Huxley had already sought to prove, that the structural difference between the lowest tribe of man and the highest of the anthropoid apes is less than that between the highest and lowest of the apes. The argument of Vogt is carefully presented, but the spirit of it has something unscientific in tone, as if the author felt it one of the great triumphs of reason over superstition to prove man descended from the monkey. The correspondences he traces between the lowest negro tribes and the apes are curious, but such as might also be found between degenerated or inferior white or Aryan tribes and different simian varieties; while his effort to show that the *microcephali*, or idiots, are the last connecting link between humanity and the animals is not happy, even under the full Darwinian hypothesis. For it is not claimed by the great theorist that the law of Natural Selection could take an arrested or imperfect development and render it the most profitable in "the struggle for existence." Few analogies throughout the vegetable or animal kingdoms would favor an instance of a new and vigorous variety or species formed from the imperfect and arrested growth of an organism. And what possible combination of circumstances there could be in which a half-human idiot would have an advantage in the struggle for life over a fully developed ape is difficult to imagine. If it be merely meant by the author, that the *cretins* and *microcephalists* show certain marked resemblances to the simian races, this does not help his point, for these similarities cannot be accounted for on the theory of "profitable variations," and are therefore of no account in the development hypothesis.

Haeckel prefixes to his truly philosophical work — the

Schöpfungsgeschichte — a rather sensational picture of the heads and facial outlines of different human and simian races ; but the monkeys are flattered and the men caricatured, and the writer, in his eagerness to support extreme views, has forgotten that, according to his leader's hypothesis, man could not be descended physically from the ape, but both must be derived from an intermediate form.

One of the illustrations in Haeckel's history is a much more convincing argument, being pictorial representations of the embryos of various classes of vertebrates at different stages of growth. As an argument for community of descent, hardly anything stronger can be found than embryonic resemblances.

This author, with the boldness of a German, does not hesitate to present his readers with a genealogical-tree of ancestors of the present family of man from the *Alfurus* and *Papuas* (whoever they may be), of the drift period, through the *Cretins*, *Microcephali*, *Gorillas*, *Orangs*, and *Gibbons*, of the *pliocene* and *miocene* periods to the *Lemures* (or half-apes) of the early *eocene*, and thus down, through vast ages of time, to the "lance-fishes" (*Amphioxus lanceolatus*) of the *silurian* period, the base of the vertebrate family.

All these German authors whom we have quoted assume that the physical descent of man from the lower animals also includes the gradual formation of his faculties and mental and moral powers through natural selection from instincts ; that these are the results of modifications of brain matter, and that thus "materialism" is scientifically founded. We may yet be compelled by science to admit that there is no essential difference in structure or brain between man and the highest order of apes, and less between them than between different species of apes ; still, singularly enough, our materialistic writers do not see that this only renders the gap wider between man and the animals, spiritually, and takes away one link in the chain of materialistic argument. Here are two brains and structures — say those of the gorilla and the African Bushman — so alike that science can hardly draw a line of essential difference between them. Yet on one side we have a language showing a considerable degree of development, capable of

expressing many human feelings, affections, and hopes, of persuading with eloquence and rising into poetry and worship; simple as it is, yet complicated and wonderful in structure, and with the power of great growth in it; we have a certain taste for art, so that pottery is made and drawings executed; a human reason, family affection, the capacity of organization and society, the ability for arts, manufacture, and commerce, and, though the Bushman is a creature, owing to bad diet and unfortunate circumstances, among the very lowest of the human race, we have, so far as one can see, a being with all the illimitable capacities of man, and destined for immortal progress. On the other hand is a creature, divided mentally and spiritually from the Bushman by an almost immeasurable gulf; without language or art or society or religion; in his constructive instincts not equal to some of his "fellow-mutes" with much smaller brains; in social capacities inferior to some of the insects; in moral qualities not equal to a (physically) much lower animal (the dog), and in reasoning power surpassed apparently by the dog and the elephant; — a being, so far as human experience reaches, with only the slightest capacity for progress. If the mind and soul be dependent on the cerebral structure, how happens it that two beings so much alike in physical structure should be so immensely apart in mental and moral development? If it be replied that transmitted speech is the great ground of difference between man and "the mute," still the transmutationists must show why a physical constitution so similar and a brain so corresponding to the human should not have invented or transmitted language.

These writers, in their eagerness to carry out the development theory to its utmost extent, have overdrawn the degradation of the lowest human races, and exaggerated their incapacity for progress. It cannot be certainly said yet that any human variety is incapable of an immense growth. Individuals of the lowest African tribes — as the Congo negroes in this country — have at times equalled the highest races in their mental development.

The gulf thus far between the Australian, the Andaman Islander, the Bushman, or the Digger Indian and the anthro-

poid apes is vast beyond almost all measurement, while it must be admitted that the physical difference is very small. Here is a link gone in the chain of materialistic reasoning. Here fairly and philosophically the inference may be drawn of forces existing which cannot be accounted for by physical derivation.

Nor will the supposition of an intermediate "missing form" help the transmutationists, as the cerebral structure is sufficiently correspondent and similar to produce, under their theory, necessary corresponding mental results.

Mr. Wallace, one of the most extreme of the Darwinians in England, admits that, at the point where, in the course of human development, mind first appeared, and natural selection worked upon mental faculties rather than upon profitable bodily changes, there was the greatest revolution which the earth has ever witnessed. There, at least, is one "cataclysm" in human history. There surely may have been inserted the supernatural power.

We admit it to be a purely scientific question. It may be, for all we know, just as consistent with the Divine attributes to create the soul through gradual development by means of natural selection from the instincts of lower orders of animals, as it is to create the body in a similar manner, or to develop the wonderful human brain and body from a cell which cannot be distinguished from the cell of the turtle. It is purely a matter of evidence. Here is a gap which has not thus far been crossed. Is it not scientific to bridge it with a "sufficient cause"?

All the German writers we have quoted, — Vogt, Büchner, Haeckel, and others, — dwell with more or less concealed elation on one great service, as they suppose, of the Darwinian theory, — that it has removed the necessity of an intelligent Creator from the theory of the universe. It gives a painful idea of the intellectual and moral status of a people, when the prospect of destroying the faith of mankind in a God is received with cheerful enthusiasm; and it is evident that we have here a reaction against bigotry which is as morbid and unnatural as was the ecclesiastical superstition it attacked.

Darwin himself does not share these extreme views of his

German followers. In the Preface to one of his editions of the *Origin of Species*, he avows his belief in a personal Creator, and, what is more to the purpose, at the close of his last great work on *Animals and Plants under Domestication*, he alludes to some of the difficulties which have met his mind, in reconciling the theory of an omniscient, benevolent, and all-disposing Creator with "a plasticity of organization, leading to many injurious deviations of structure," and "a redundant reproduction," from which arises "the survival of the fittest"; but consoles himself that these are difficulties of a similar class which meet one in regard to "free will and predestination." To his mind, plainly, the great hypothesis does not exclude the necessity of a Creator, though it presents difficulties which are equally great under the usual moral theories of Providence.

It is plain that the *Paleyan* theory of creation, and the form of the celebrated "argument from design," must now be dropped. The wonderful contrivances of the organic and inorganic world are not precisely like the works of a watch, which a person examining says must have had a direct intelligent maker. It is rather as if a man found a series of watches of such wonderful mechanism, that each one came forth from the preceding, and was the product of its machinery; or as if one examining the complicated works of a large factory should search for its originating power, through wheel after wheel, band after band, lever after lever, until he came by a long process to the fall of water or the force of gravity. Such wonderful adaptations as those of the white partridge to the snow, the green insect to the leaf, the wingless beetles to the windy coasts of an island, the corollas of the red clover to the humble-bee, the curious "mimicries" by one species of insects of another, preserving them from enemies, the instinct of the hive-bee in the structure of its cell, or such homologies of structure as exist between all the branches of the vertebrate family, together with countless other ingenious contrivances and adaptations, are not to be looked upon as intermediate contrivances of an intelligent Creator to produce such and such results. They are the effects of an immense series of forces, balancing and counterbalancing, opposing and combining, through count-

less æons; the final fruits of such laws as the continued transmission of the cells of each organism, the immense overproduction of all forms of life, the change of each by forces known and unknown, the necessary destruction of all unsuited to their circumstances, and the survival of such forms or organisms as are best suited to their conditions.

There is, indeed, a machinery of nature, a clock-work which speaks of an inventor, but a machinery complicated, interdependent, boundless, wherein every wheel, even the smallest, is the work of the balancing of forces without number, and each cog and spring is the fruit of agencies millions of centuries old. The Inventor is there, but much farther away than our former science taught. His hand is equally necessary to explain the machinery, but it works with more wonderful tools and in more complicated methods than the age of Paley knew. The blind forces which act in this astonishing manner, and are convertible from one to the other, must still be traced back to the originating Force. The first cell of *life*, with all its boundless capacities and unseen forces, must be explained. The wonderful plan must be accounted for.

Even the most bitter of the German atheists admit that there is throughout all the records of fossil life, and all the arrangements of the present kingdoms of life, clear evidence of a steady, continuous PROGRESS. The laws of differentiation and progressive growth, though showing occasional exceptions, lie clearly at the basis of creation. In the physical, mental, and moral world there has been from the beginning, and there must be forevermore, an eternal growth or improvement. No Darwinian can deny this. What higher evidence of an intelligent, benevolent, all-wise Creator than a physical and moral creation, based on laws of infinite progress?

It is true that in this, as in other reasonings on origin, we are not to take our *a priori* conceptions. The Divine Architect does not apparently plan from the beginning (as we might have expected) the size and shape and fitness of each stone in his wonderful edifice. He appears, on the contrary, to arrange forces which are continually shaping and reshaping the countless blocks; some come forth imperfect, some crumble and

become material for other uses, some have no apparent connection with his plan ; many seem tentative, others even obscure, and injure the harmony ; still at length, through all the confusion and destruction, stone is laid upon stone, here one for lintel, there another for arch, here for strength, there for beauty ; columns, arches, and pinnacles appear, and at length a structure of matchless symmetry, harmony, beauty, and grandeur rises from the ruin below ; one never to our view completed, but always rising imperceptibly to greater perfection.

In attempting to conceive the divine plans of the great Architect, we are of course in a region where human faculties reach but little way ; yet it seems a possible conception of an infinite Creator, that he should be able to arrange forces on a general plan, whose particular results he should clearly foresee ; even knowing the future failures and half-effects of these "laws" which he sustains, while the great object of Progress and Completeness is being steadily worked out.*

How any one could regard the Darwinian conception of the Creator as an inferior one we cannot understand. To our mind, the vast, manifold, almost infinite intertwining of causes, which under that theory should produce the most simple effects ; the astonishing and incredible complication and interdependence of the kingdoms of life which Darwin has attempted to illustrate ; the thought that the destruction of a single thread in the infinite network of forces would desolate the earth of beautiful forms of life, or would over-people it with hideous ; that each little violet, for instance, which gladdens our eye on a country walk has depended for its existence on a balancing and interworking of innumerable forms of life during "ages of ages," and is the result of laws old as creation ; and that there is at the centre ONE holding the tangled threads of this vast net-

* "That proposition is, that the whole world, living and not living, is the result of the mutual interaction, according to definite laws, of the forces possessed by the molecules of which the primitive nebulosity of the universe was composed. If this be true, it is no less certain that the existing world lay, potentially, in the cosmic vapor ; and that a sufficient intelligence could, from a knowledge of the properties of the molecules of that vapor, have predicted, say the state of the fauna of Britain in 1869, with as much certainty as one can say what will happen to the vapor of the breath in a cold winter's day." — HUXLEY, in the *Academy*.

work of causes, or rather that the power which is continually weaving on this immense "loom of life" is One, — to us such a scientific conception has in it something corresponding to our highest moral intuition of HIM the "All-controlling."

Wer darf IHN nennen?

Der ALLUMFASSER!

Der ALLERHALTER!

C. L. BRACE.

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- ART. IV. — 1. *History of the Legal-Tender Paper Money issued during the great Rebellion, being a Loan without Interest, and a National Currency.* Prepared by HON. E. G. SPAULDING, Chairman of the Sub-committee of Ways and Means at the Time the Act was passed. Buffalo. 1869.
2. *Opinion delivered in the Supreme Court of the United States by CHIEF JUSTICE CHASE, on the 7th of February, 1870, in Regard to the Construction of the Legal-Tender Act.*

DURING the Rebellion the United States armies suffered many disasters in the field, which for the moment were felt as direct and personal misfortunes by every loyal citizen. So strong was the public feeling of anger and astonishment, that Congress appointed committees of investigation, to examine into the causes of these military failures, and subjected the whole conduct of the war to a searching and sometimes a severe criticism. In finance, on the other hand, the nation suffered only one great disaster, but its effects have extended far beyond the period of the war, and are likely to be felt with unmitigated force for an indefinite time yet to come. The causes of this catastrophe have not been investigated by Congress; but as the day may probably come when the national government will have been forced to accept the fact that the act of national bankruptcy was a calamity so terrible as to involve the personal and political credit of every man in whose charge the people had then placed the common interests, it may be useful to point out the path which the future congressional committee on the conduct of the finances will be compelled to follow in